

BNSDOCID: <WO_9730375A1 | >

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AM	Armenia	GB	United Kingdom	MW	Malawi
AT	Austria	GE	Georgia	MX	Mexico
AU	Australia	GN	Guinea	NE	Niger
BB	Barbados	GR	Greece	NL	Netherlands
BE	Belgium	HU	Hungary	NO	Norway
BF	Burkina Faso	IE	Ireland	NZ	New Zealand
BG	Bulgaria	IT	Italy	PL	Poland
BJ	Benin	JP	Japan	PT	Portugal
BR	Brazil	KE	Kenya	RO	Romania
BY	Belarus	KG	Kyrgyzstan	RU	Russian Federation
CA	Canada	KP	Democratic People's Republic of Korea	SD	Sudan
CF	Central African Republic	KR	Republic of Korea	SE	Sweden
CG	Congo	KZ	Kazakhstan	SG	Singapore
CH	Switzerland	LI	Liechtenstein	SI	Slovenia
CI	Côte d'Ivoire	LK	Sri Lanka	SK	Slovakia
CM	Cameroon	LR	Liberia	SN	Senegal
CN	China	LT	Lithuania	SZ	Swaziland
CS	Czechoslovakia	LU	Luxembourg	TD	Chad
CZ	Czech Republic	LV	Latvia	TG	Togo
DE	Germany	MC	Monaco	TJ	Tajikistan
DK	Denmark	MD	Republic of Moldova	TT	Trinidad and Tobago
EE	Estonia	MG	Madagascar	UA	Ukraine
ES	Spain	ML	Mali	UG	Uganda
FI	Finland	MN	Mongolia	US	United States of America
FR	France	MR	Mauritania	UZ	Uzbekistan
GA	Gabon			VN	Viet Nam

Specification

METHOD AND APPARATUS FOR CONFIGURING A CAMERA
THROUGH EXTERNAL MEANSBACKGROUND OF THE INVENTIONField of the Invention

The present invention relates generally to a method and apparatus for configuring a camera through external means, and more particularly to a method and apparatus for setting up a camera's behavioral parameters and operating system, as well as data base text and graphics information by way of an external device.

Brief Description of the Prior Art

Prior art cameras have developed to include a wide range of automatic features including smart light sensing circuitry that measures the light from a subject and automatically sets the aperture and speed, and engages a flash unit when the light is below an acceptable level. Cameras also include intelligent light sensing with operator adjustable settings for directing the camera to measure light from a subject and ignore the surrounding light conditions, as well as settings that direct the camera to adjust the aperture and speed for maximum depth of field.

Digital cameras are available that store image data along with the associated camera parameters, such as aperture and exposure number. All of this information can be loaded onto a PCMCIA card and then transferred to a PC. The PC can then print out the image along with any other accompanying information the user may enter on the PC. Alternatively, some cameras can bypass the PCMCIA card and transfer the image data directly to a PC. These sophisticated cameras have operating systems built into their structure that transform the raw image data for compatibility with a particular PC software that is specially designed for the purpose of handling images.

1 The prior art cameras discussed above have many advanced
2 features, but they are limited in a number of important areas.
3 For example, no provision is made to record and output arbitrary
4 user input data along with image data, or to do so through a
5 general purpose PC. Such a feature would add significant
6 flexibility to the entering of data. Also, the prior art cameras
7 are preprogrammed to operate with a particular operating system
8 supplied for the purpose of converting the raw image data to a
9 form compatible with a corresponding special PC application
10 program. This special one-on-one matching of the camera with the
11 PC is a situation which can be very inconvenient if the PC on
12 hand is not appropriately programmed.

13 There is clearly a need for a camera with the facility
14 allowing a user to modify its operating system and behavioral
15 parameters in the field, and that can receive and store arbitrary
16 information related to the images, as well as specialized
17 application software as determined by the user.

18 19 SUMMARY OF THE INVENTION

20 It is therefore an object of the present invention to
21 provide a method for configuring a camera through external means.

22 It is a further object of the present invention to provide
23 a method for setting the operating system of a camera through
24 external means, i.e., downloading an executable code for redoing
25 the firmware.

26 It is a further object of the present invention to provide
27 a method for entering graphics and text data to a camera through
28 external means.

29 It is a still further object of the present invention to
30 provide a method for entering user defined specialized
31 application code/modules to a camera through external means.

32 It is a still further object of the present invention to
33 provide a method for entering data base information to a camera
34 through external means.

35 It is another object of the present invention to provide a
36 camera having the capability of being configured through external
37 means.

1 It is a further object of the present invention to provide
2 a camera capable of having its operating system entered and
3 modified through external means.

4 It is another object of the present invention to provide a
5 camera having the capability of receiving data base information
6 through external means.

7 Briefly, a preferred embodiment of the present invention
8 includes a camera having a built in microprocessor for accepting
9 configuration data from an external device. The camera has a
10 serial port, and a slot for receiving standard type II and III
11 PCMCIA cards for data input and output. These features provide
12 the camera with the capability of being programmed by an external
13 device through the serial port or PCMCIA card. This is done for
14 a number of purposes including downloading a particular
15 operating system, and for adjusting the camera operational
16 parameters such as film type (for film based cameras), flash
17 control, shutter speed, aperture, light sensing of a particular
18 object area to be photographed, adjustments for maximum depth of
19 field or not, and adjustments for black and white photography or
20 for color parameters, etc. and for entering data base
21 information. Furthermore, the camera allows the downloading of
22 graphics and textual information to be included with a particular
23 image data, and downloading of specific application modules. The
24 configuring of parameters involving the image acquisition
25 process, including the parameters listed above, and the entry of
26 data base information is fully applicable to both film base and
27 digital cameras. The camera processor and memory is designed and
28 programmed to receive and store the configuration data, including
29 data base information to accompany an image, as well as other
30 information such as the image acquisition parameters. The data
31 base information and parameters to be outputted with the image
32 data can be either stored digitally on a digital camera, or as
33 APS film base magnetic information on a film based camera, or
34 optically encoded on the film.

35 An advantage of the present invention is the capability of
36 changing the camera operating system and downloading an

1 executable code to conform to a particular available PC operating
2 system through an external device.

3 A further advantage of the present invention is the
4 provision of features allowing the downloading of graphics and
5 text information which can be recorded along with the image or
6 displayed/overlaid as part of the image.

7 A further advantage of the present invention is the ability
8 to adjust the image acquisition parameters including color
9 balance, exposure, default flash operations, etc., through an
10 external device.

11 A still further advantage of the present invention is the
12 provision of a camera with the facility for downloading
13 additional specialized modules within the framework of the
14 existing operating systems.

15 Another advantage of the present invention is the facility
16 for receiving operational parameters from another similar camera,
17 and the facility for storing parameters of a particular shoot and
18 repeating them at a later time.

19 IN THE DRAWINGS

20
21
22 Fig. 1 shows two cameras, an external device and various
23 methods of transferring data;

24 Fig. 2 is a block diagram illustrating methods of
25 downloading data to a camera;

26 Fig. 3 is a block diagram showing the various types of
27 configuration data included in the method of the present
28 invention;

29 Fig. 4 is a block diagram illustrating certain component
30 parts of the camera;

31 Fig. 5 illustrates optically transferring data to a
32 photographic film; and

33 Fig. 6 illustrates placing data on a magnetic film strip
34 associated with a photographic film.

35 Description of the Preferred Embodiment

36

1 A preferred embodiment illustrating the method and apparatus
2 of the present invention is shown in Fig. 1 of the drawing.
3 There is a first camera 10, a second camera 12 and a personal
4 computer system 14. Each of the cameras 10, 12 includes a built-
5 in processor and memory. The camera is designed to input and
6 output data by means of either a port 16 or a slot 18. An
7 alternate embodiment includes a receiver or transceiver 20, which
8 may or may not be built into the camera body. The present
9 invention includes cameras with one or more of these input/output
10 types, or other types of input/output known to those skilled in
11 the art. For ease of discussion and illustration, the two
12 cameras 10, 12 will be considered identical, although they can
13 have different features as long as they have the ability to
14 communicate with each other through a common protocol.
15 Discussion or reference to camera 10 will therefore generally
16 apply to camera 12.

17 The preferred embodiment of the camera 10 slot 18 is a
18 receptacle for a removable temporary storage device 22, such as
19 a standard type II or III PCMCIA memory card. Other types of
20 data input/output devices are also included in the spirit of the
21 invention, such as a hard drive, or a standard 3.5 inch disk
22 drive. Similarly, port 16 is preferably serial, but a parallel
23 port is also included in the spirit of the present invention.

24 The receiver 20 is preferably an infrared receiver, but
25 could also be a transceiver, for both transmitting or receiving
26 infrared data signals. Other types of transmission or reception
27 media are also included in the spirit of the invention, such as
28 radio signals. The camera 10 is also shown in Fig. 1 to have
29 optics 24 for perceiving the external scene to be photographed,
30 and control buttons 26 for operating the camera 10. Cable 28 is
31 for transferring data from a first camera 10 to a second camera
32 12 or vice versa by way of ports 16. Cable 30 is for transfer
33 of data from the port 16 of camera 10 to the PC 14 port 34, or
34 from the PC to the camera.

35 The PC 14 as illustrated has a slot 32 for receiving the
36 storage device 22. In operation, configuration data from the PC
37 14 is loaded onto the storage device 22, which can then be

1 removed and inserted into slot 16 of the camera 10. The camera
2 then downloads the configuration data. Upon image acquisition
3 by the camera, the corresponding image data, along with all
4 related data can then be loaded onto device 22, and then removed
5 from the camera and inserted into slot 32 of the PC (external
6 device) to enter the image data into the PC 14. This transfer
7 of data can also be done through the cable 30 from serial port
8 16 of the camera to port 34 of the PC. As with the camera 10,
9 an alternate embodiment the PC can also input or output data by
10 other means, such as through use of a 3.5 inch diskette and
11 drive. The PC, as illustrated in Fig. 1 shows a transmitter 36
12 for transmitting data through modulated radiated signals 38 to
13 the camera 10. Alternative embodiments include item 36 as a
14 transceiver. The signal 38 can be infrared or other types, such
15 as radio signals. The transmitters 20 and 36 can also include
16 modems to cellular phones, or can simply be a modem for direct
17 connection 21 to a telephone network (network not shown), in
18 which case the radiated (RF/infrared) signal capability may or
19 may not be included. Referring again to the cables 28 and 30,
20 they can be wire cables with connectors as shown, or they can be
21 other types of cables such as an optics cable with the required
22 light to electrical conversion circuitry.

23 A still further alternative embodiment of the invention
24 includes replacing PC 14 with an external device, such as a
25 dedicated device for loading data into the camera 10, or for
26 loading and receiving data to and from the camera, and for
27 processing the data from the camera to display the image and
28 associated textual and/or configuration parameter data. In the
29 following text and claims, the term "external device" will be
30 used to refer to PC 14 and all of the many alternative devices
31 as above described. The term PC can also be replaced more
32 generally with simply "computer", and wherever the term PC is
33 used in the general discussion, the more general term "external
34 device" is to be implied. Additionally, when the terms
35 "operating systems", "behavioral parameters" and "data base
36 information" are used in description of data being transferred,

1 the term "data" is implied, such as "operating system" instead
2 of "operating system data".

3 In operation of the present invention, a user enters the
4 configuration data into PC 14. This data includes the operating
5 system, behavioral parameters, data base information, text and
6 graphics, and any specialized application module code. Then,
7 through any of the transmission methods (cable, card, radiated
8 signal, etc.), the user loads the operating system into the
9 camera 10. The behavioral parameters include such information
10 as aperture speed, film type, color information, etc. After the
11 configuration data is loaded into the camera, the user then
12 captures the image(s) through use of controls 26, the camera
13 recording the image data, and associating it with the required
14 textual, graphics and camera behavioral parameters for the
15 particular image. The data for the various "pictures" taken can
16 then at a later time be transferred to the PC 14 by way, again,
17 of either the card, cable or radiated signal. The user can then
18 process the image according to the corresponding compatible
19 program on the PC. A benefit of this system is that the camera
20 can be programmed to be compatible with any PC image processing
21 system. As a result, the programmable camera is a much more
22 flexible and useable device.

23 The two cameras 10, 12 in Fig. 1 illustrate another use of
24 the programmable camera 10. Configuration data, including an
25 operating system, behavior parameters, data base information, and
26 text and graphics are loaded by PC 14/external device into camera
27 10. At a later time, the user downloads the configuration data
28 from the first camera 10 directly to a second camera 12. This
29 can be done through the various means discussed above, including
30 the cable 28, storage device 22, or radiated signals through
31 transceivers 20.

32 The method of the present invention and operation of the
33 apparatus is more fully described through use of Fig. 2, showing
34 the various operations depicted in block diagram form. According
35 to the figure, the operation begins with block 40 defining the
36 input of data to the PC 14. Block 40 indicates that data can be
37 entered from various sources including a camera, a PC, a

1 removable storage device, or any other devices discussed above.
2 The removable storage device can be one or more of a variety of
3 devices including the temporary device 22, as above described in
4 reference to Fig. 1. The data input can be of any type, such as
5 textual information, operating system, camera parameters, graphic
6 information and application modules executable code, including
7 specialized application module code for specific functionality
8 as determined by a user. The graphic information can be such
9 things as logos, and programming as provided according to the
10 present invention to allow the graphic data to overlay the image
11 data or be placed elsewhere. Included in or clearly related to
12 graphics is the capability of including handwriting with the
13 image data, again, as an overlay or elsewhere. Once the PC 14
14 or other external device has received all of this information and
15 has configured it according to the application program being
16 used, the information is either saved on the PC as indicated in
17 block 50 and then later sent to the camera, or sent without
18 saving the data, as indicated by line 52. The data from the PC
19 14 can then be transferred to the camera by one of the methods
20 described above in reference to Fig. 1. Blocks 54 and 56
21 illustrate the use of a removable device. Block 54 illustrates
22 the loading of the configuration data from the external device
23 to the removable device. The removable device is then extracted
24 from the PC and connected to the camera, and the data loaded into
25 the camera memory; the operation indicated by block 56. At this
26 point, the camera is ready for operation, as depicted by block
27 69. Blocks 58 and 60 indicate two other methods of transferring
28 data from an external device to a camera. Block 58 specifies a
29 form of radiated signal. A preferred embodiment of this would
30 be infrared transmission, but other signals are also included,
31 as mentioned above. Alternatively, some type of cable can be used
32 to connect the external device to the camera as indicated in
33 block 60. The cable can be of any type known to those skilled
34 in the art, including the various wire cables and optic cables.
35 These are all indicated generally in Fig. 1 as cable 30.

36 The configuration data is then downloaded to the camera.
37 This operation is indicated by blocks 62-68. The operations of

1 downloading in blocks 62-68 generally apply to the loading
2 operation of block 56 as well. Block 62 indicates that in order
3 to download a new operating system, the camera processor must be
4 directed to switch to "boot strap mode", and then the new
5 operating system and special application modules can be loaded
6 as indicated in block 64. Block 66 indicates the downloading of
7 textual types of data and other data to be included with an
8 image, such as graphics data. Block 68 specifies the downloading
9 of the camera behavioral parameters, including shutter speed,
10 color parameters, etc. Note that block 68 refers to the camera's
11 memory. This memory can be any form of programmable memory, such
12 as RAM, CMOS, disks or any form of removable storage device. In
13 fact, this also applies to all data loaded into the camera since
14 it all must be stored for future use. Following the downloading,
15 the camera is ready for use as indicated by block 69.

16 In the process of "picture taking" or image acquisition, the
17 camera stores the image data and other data to be associated with
18 the image as discussed above. This data will be referred to as
19 "selected data", for easy reference and in order to distinguish
20 it from other data, such as configuration data which also
21 contains the operating system data. The selected data is then
22 ready for the reverse operation of sending it through one of the
23 three transfer methods i.e., cable, card or modulated, radiated
24 signal, to the external device (PC, etc.). Once loaded into the
25 external device, the selected data is processed according to the
26 application program (previously loaded in the external device)
27 in accordance with any options allowable.

28 There are many camera parameters that can be altered
29 according to the method of the present invention. Fig. 3 is a
30 block diagram showing a number of these parameters. Other
31 parameters, more or less than these, are also included in the
32 spirit of the present invention. The process/method begins with
33 the creation of a setup file 70, whereupon the various parameters
34 are grouped into three classes indicated in blocks 72, 74, 76.

35 The capturing of the image or i.e., acquisition taking is
36 indicated in block 72. This class includes such things as
37 setting of color balance, flash mode, etc. which affect the

1 picture taking stage. These are the parameter settings and the
2 format can be textual (ACSII) or similar format. Block 74
3 defines the class dealing with the operating level. This data
4 affects the camera operation in general, and the information is
5 usually an executable file. Block 76 defines the third class
6 containing nonacquisition data such as data base information
7 which is added to an image. This class of information does not
8 affect the actual picture taking.

9 Referring now to the image acquisition parameters (class
10 72), the first row of parameters includes setting the color
11 parameters 78, setting of default values for different lighting
12 conditions 80, and setting a default start up mode 82.

13 In blocks 80 and 82, setting default values i.e. parameters,
14 refers to the behavior of the camera on startup 82, and
15 specifically for different lighting conditions 80. For example,
16 if the startup default is <flash>, the flash will be activated
17 (block 82), and the flash setting 80 is set for either "auto",
18 "on", "off", "fill", or "full". The second row of parameters
19 includes setting the picture numbering scheme 84, setting the
20 first picture number 86, defining the set steps 88, and assigning
21 a prefix or postfix 90. Block 92 describes the setting of the
22 file format and block 94 defines the compression rate, indicating
23 how images are to be compressed to save storage space. Block 96
24 involves the setting of a default flash start up mode and block
25 98 defines the specific flash mode as "auto" or "on" or "off" or
26 "fill". A "self timer" setting is included in block 100 and a
27 "sleep time" in block 102. The self-timer controls the amount
28 of time the camera waits from the moment the button is pushed to
29 picture taking when the camera is set on self mode. The
30 sleeptime 102 controls when the camera will switch off after a
31 given time period of inactivity to save battery life.

32 The operating level class 74 involves setting the core
33 system and application tools and module. The operating system
34 is downloaded 104 either from a PC (block 106) or from a
35 removable device (block 108). Application tools and modules are
36 downloaded (block 109). These include imaging tools 110
37 including geometric tools 111 and image filter 113. For example,

1 imaging tool 110 may include specialized imaging filter 113 for
2 transforming the acquired images prior to storage or
3 transmission. The tools/modules 109 also include communications
4 tools 115 for controlling the various methods of receiving and
5 sending data, such as PCMCIA card, serial port to cable, disk,
6 modem, etc, and custom tools 117.

7 The third class of information, involving additional image
8 related data 76, includes setting the image data base record
9 template (block 112), setting the data base fields 114 and the
10 field attributes 116. Block 120 is a general block including any
11 freestyle comment/text, such as a copyright notice 118 and
12 setting comments and notations 119. Block 121 includes graphic
13 information which may be positioned to overlay the image, or can
14 be placed elsewhere as indicated in block 123, the particular
15 position determined by the user (block 125).

16 Referring now to Fig. 4, the major functional blocks of the
17 camera 10 are illustrated. There is a processor 122
18 interconnected by bus 124 to memory 126, and in communication
19 with the receiver/transmitter 20, cable connector 16, and card
20 slot 18 through buses 134, 136 and 138. The processor 122
21 communicates and controls the image acquisition through bus 140
22 to the image acquisition block 142 and controls and receives
23 image data from the image storage block 144 by way of bus 146.

24 The configuration data is received by either of devices 16,
25 18 or 20 and passed to the processor 122. The processor in
26 cooperation with memory 126, including any ROM based startup
27 programming, parses, executes, compiles, or links (dynamically
28 or statically) the incoming configuration data, storing data as
29 directed in memory 126.

30 Memory 126 can also store image data. This could apply in
31 an embodiment wherein the image data is digital. For generality,
32 the separate image storage block 144 is shown, representing the
33 storage of image data and image related data. Block 144
34 represents digital storage for a digital camera or optical or
35 magnetic storage for film based cameras. The image acquisition
36 block 142 includes the usual optics and optic control apparatus,
37 and in the case of a digital camera the conversion circuitry for

1 converting the image to electrical data for storage. In a film
2 based camera, blocks 142 and 144 should be considered as one
3 block 145 including the film control apparatus and storage of
4 data on magnetic strips or optically storing data on the film.

5 In the case of a film based camera, the film stores the
6 image in the usual manner by film exposure. In addition,
7 configuration data can also be stored on the film by optical
8 means (an optical decoder) such as through use of LEDs for
9 exposing the film with textual data. This is illustrated in Fig.
10 5 where the film 148 is exposed by light 150 from LEDs 152 to
11 photographically place data on the film 148 at position 154.
12 Fig. 6 illustrates a film 156 having a magnetic strip 158 wherein
13 selected configuration data can be stored through use of a
14 magnetic recorder head 160. The actual structures and associated
15 electronics and interconnections will be understood by those
16 skilled in the art and are not shown.

17 Although a preferred embodiment of the present invention has
18 been described above, it will be appreciated that certain
19 alterations or modifications thereon will be apparent to those
20 skilled in the art. It is therefore that the appended claims be
21 interpreted as covering all such alterations and modifications
22 that fall within the true spirit and scope of the invention.
23

24 What is claimed is:

CLAIMS

1 1. A method of configuring a camera through an external
2 device comprising:

3 (a) entering configuration data to said external
4 device;

5 (b) transferring said configuration data to said
6 camera; and

7 (c) implementing said configuration data in said
8 camera.

1 2. A method as recited in claim 1 wherein said
2 configuration data includes the camera's operating system data.

1 3. A method as recited in claim 1 wherein said
2 configuration data includes specialized application module code
3 for specific functionality as determined by a user.

1 4. A method as recited in claim 1 wherein said
2 configuration data includes the camera's behavioral parameter
3 data.

1 5. A method as recited in claim 1 wherein said
2 configuration data includes data base information data.

1 6. A method as recited in claim 1 wherein said
2 configuration data includes free style text.

1 7. A method as recited in claim 1 wherein said
2 configuration data includes graphics information.

1 8. A method as recited in claim 7 wherein said graphics
2 information includes handwriting.

1 9. A method as recited in claim 1 wherein said
2 transferring said configuration data to said camera is
3 accomplished by way of interconnection of said external device
4 to said camera through a cable.

1 10. A method as recited in claim 1 wherein said
2 transferring said configuration data to said camera is
3 accomplished by first transferring said configuration data from
4 said external device to a removable device, and then transferring
5 said configuration data from said removable device to said
6 camera.

1 11. A method as recited in claim 1 wherein said
2 transferring said configuration data to said camera is
3 accomplished by way of connection to an transmission through a
4 telephone network.

1 12. A method as recited in claim 11 wherein said connection
2 to said telephone network is by way of interconnection to a
3 modem.

1 13. A method as recited in claim 1 wherein said connection
2 to said telephone is by way of a cellular phone.

1 14. A method as recited in claim 10 wherein said removable
2 device is a removable temporary storage device.

1 15. A method as recited in claim 1 wherein said
2 transferring said configuration data to said camera is
3 accomplished by transmitting said configuration data through a
4 modulated radiated signal from said external device, and
5 receiving said modulated radiated signal by said camera.

1 16. A method as recited in claim 1 wherein said camera is
2 a first camera and said external device is a second camera.

1 17. A method as recited in claim 1 wherein said external
2 device is a computer.

1 18. A method as recited in claim 1 wherein said
2 implementing involves linking said configuration data to an
3 operating system of said camera.

1 19. A programmable camera comprising:
2 communication means for receiving configuration data
3 from an external device;
4 means for implementing said configuration data; and
5 means for sending selected data.

1 20. A camera as recited in claim 19 wherein said
2 communication means includes a cable connection for receiving and
3 sending said configuration data and said selected data through
4 a cable from and to said external device.

1 21. A camera as recited in claim 19 wherein said
2 communication means includes a card slot for receiving and
3 sending said configuration data from and to a card.

1 22. A camera as recited in claim 19 wherein said
2 communication means includes a receiver for receiving said
3 configuration data in the form of a modulated radiated signal
4 from said external device.

1 23. A camera as recited in claim 19 wherein said
2 configuration data includes said camera's operating system data.

1 24. A camera as recited in claim 19 wherein said
2 configuration data includes said camera's behavioral parameter
3 data.

1 25. A camera as recited in claim 19 wherein said
2 configuration data includes data base information data.

1 26. A camera as recited in claim 19 wherein said
2 configuration data includes textual data.

1 27. A camera as recited in claim 19 wherein said
2 configuration data includes graphics data.

1 28. A camera as recited in claim 27 wherein said graphics
2 data includes handwriting.

1 29. A camera as recited in claim 27 further comprising
2 means for overlaying said graphic data on acquired image data.

1 30. A camera as recited in claim 19 further comprising:
2 (a) memory means for storing said configuration data;
3 (b) image acquisition means for receiving an image and
4 converting said image to image data that can be stored; and
5 (c) image storage means for storing said image data.

1 31. A camera as recited in claim 30 wherein said image data
2 is digital image data.

1 32. A camera as recited in claim 19 further comprising:
2 (a) image acquisition means for receiving an image and
3 storing a representation of said image on a film; and
4 (b) magnetic storage means for storing selected
5 portions of said configuration data.

1 33. A camera as recited in claim 19 further comprising:
2 (a) image acquisition means for receiving an image and
3 storing a representation of said image on a film; and
4 (b) optical storage means for recording selected
5 portions of said configuration data on said film.

1 34. A camera as recited in claim 26 further comprising means
2 for overlaying said textual data on acquired image data.

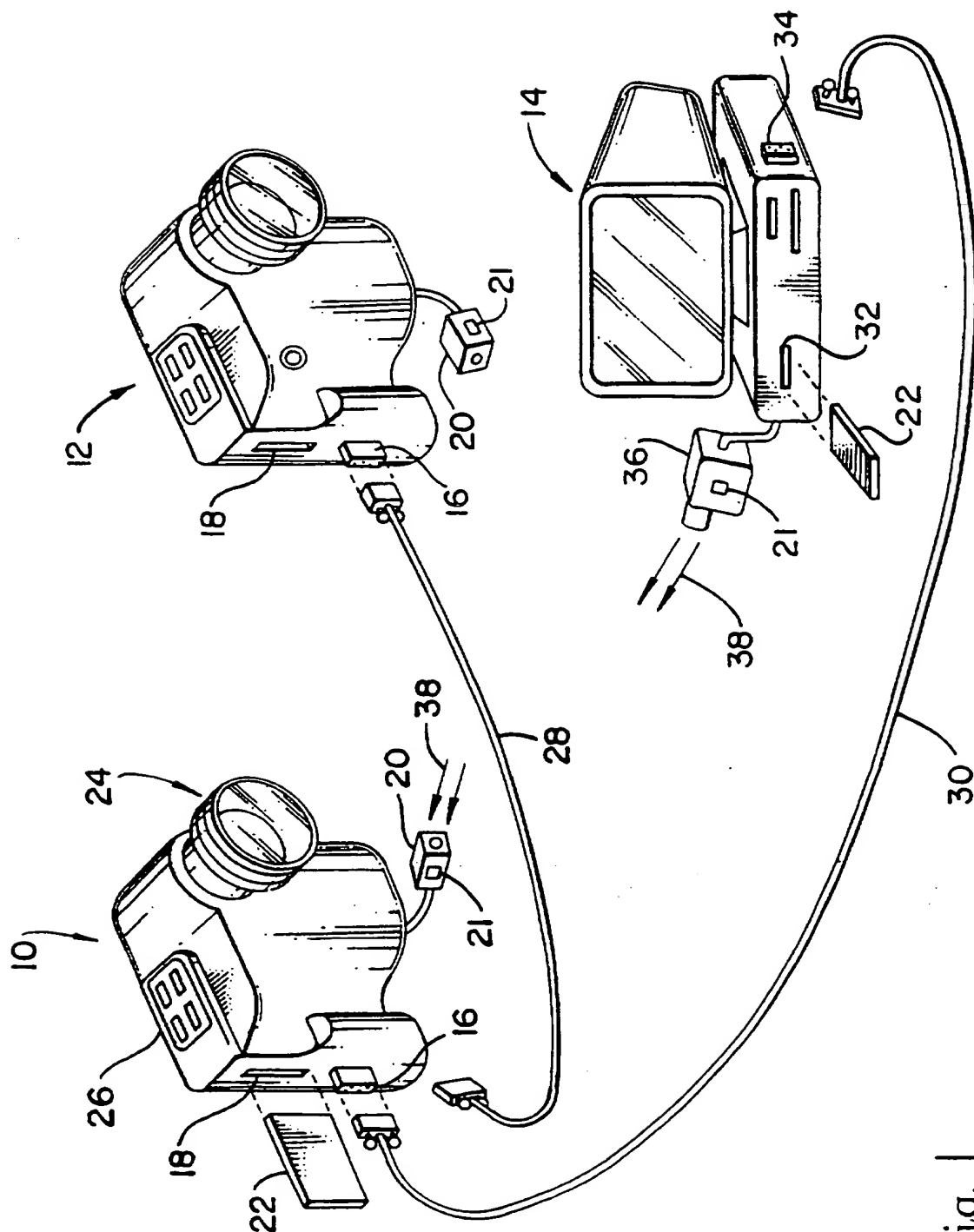


Fig. 1

SUBSTITUTE SHEET (RULE 26)

2 / 4

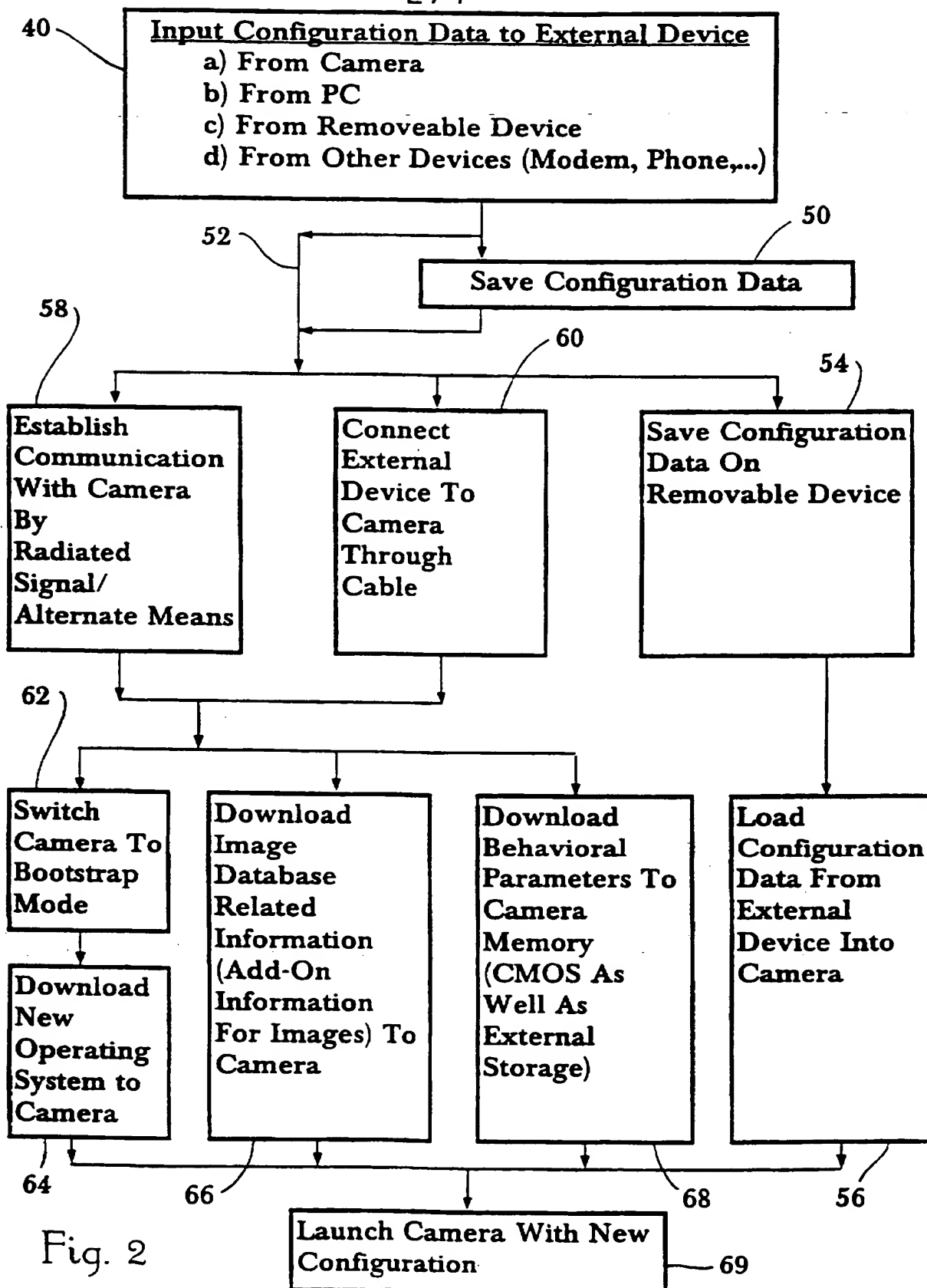


Fig. 2

SUBSTITUTE SHEET (RULE 26)

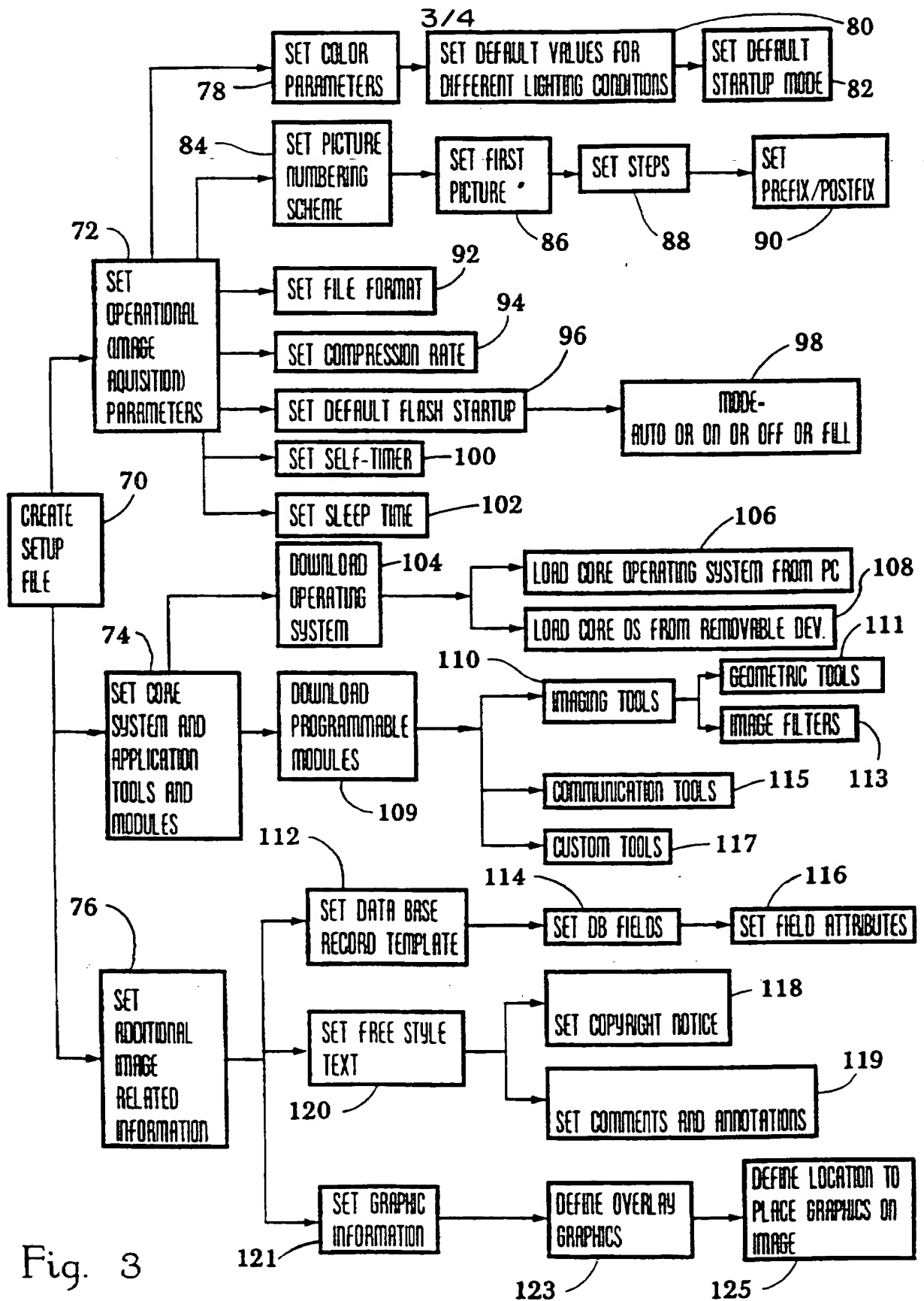


Fig. 3

SUBSTITUTE SHEET (RULE 26)

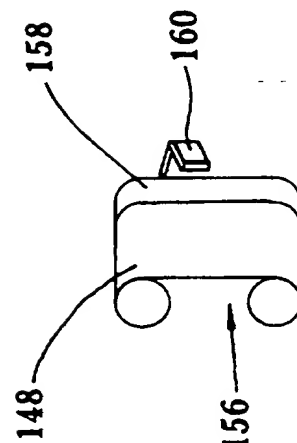
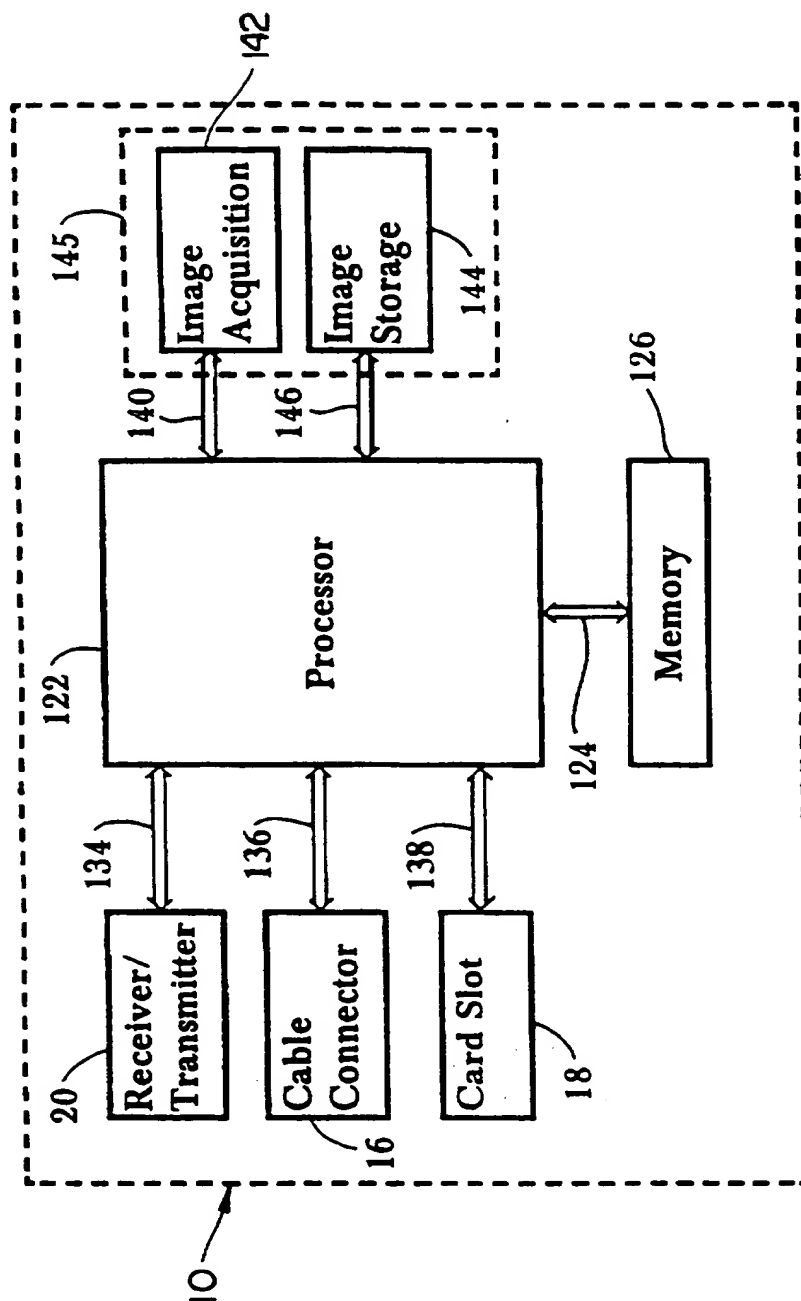


Fig. 4

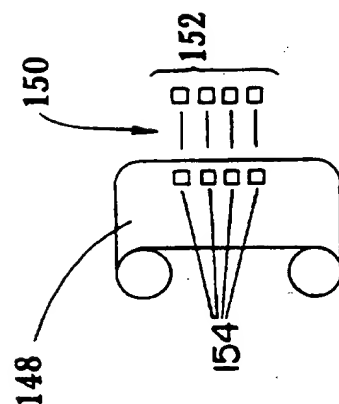


Fig. 5

Fig. 6

INTERNATIONAL SEARCH REPORT

1 national application No.
PCT/US97/02358

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) : G03B 7/00, 17/24; H04N 1/23, 5/238

US CL : 396/48, 56, 57, 211

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 396/48, 56, 57, 211

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

USPTO APS, STN

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X ---- Y	US 5,036,344 A (INOUE ET AL.) 30 July 1991, Fig. 8.	1-8, 10-14, 17-19, 21, 23-28, 30-33 ----- 9, 16, 20, 29, 34
X ---- Y	US 5,389,989 A (HAWKINS ET AL.) 14 February 1995, Fig. 6 and Col. 5-6.	1-8, 10-19, 22-28, 30-33 ----- 9, 20, 29, 34
Y	US 5,164,836 A (JACKSON ET AL) 17 November 1992, Fig. 1.	9, 20
Y	US 5,416,510 A (LIPTON ET AL.) 16 May 1995, Fig. 1c.	16

☒ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

* Special categories of cited documents:
 "A" document defining the general state of the art which is not considered to be of particular relevance
 "E" earlier document published on or after the international filing date
 "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
 "O" document referring to an oral disclosure, use, exhibition or other means
 "P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
 "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
 "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
 "Z" document member of the same patent family

Date of the actual completion of the international search

11 MAY 1997

Date of mailing of the international search report

01 JUL 1997

Name and mailing address of the ISA/US
Commissioner of Patents and Trademarks
Box PCT
Washington, D.C. 20231

Facsimile No. (703) 305-3230

Authorized officer

Safet Metjahic

Telephone No. (703) 308-1436

Form PCT/ISA/210 (second sheet)(July 1992)*

INTERNATIONAL SEARCH REPORT

Int. application No.
PCT/US97/02358

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,383,027 A (HARVEY ET AL.) 17 January 1995, col. 8.	29, 34
A	US 4,835,563 A (LARISH) 30 May 1989, Fig. 1.	16

Form PCT/ISA/210 (continuation of second sheet)(July 1992)*